CLAIMS

1. A method of diagnosing or prognosticating Alzheimer's disease in a subject, or determining whether a subject is at increased risk of developing said disease, comprising determining a level and/or an activity of

(i) a transcription product of a gene coding for SGPL1, and/or

(ii) a translation product of a gene coding for SGPL1, and/or

(iii) a fragment, or derivative, or variant of said transcription or translation product,

in a sample obtained from said subject and comparing said level and/or said activity to a reference value representing a known disease or health status, thereby diagnosing or prognosticating said neurodegenerative disease in said subject, or determining whether said subject is at increased risk of developing said neurodegenerative disease.

2. A kit for diagnosing or prognosticating Alzheimer's disease in a subject, or determining the propensity or predisposition of a subject to develop such a disease, said kit comprising:

(a) at least one reagent which is selected from the group consisting of (i) reagents that selectively detect a transcription product of a gene coding for SGPL1 and (ii) reagents that selectively detect a translation product of a gene coding for SGPL1;

whereby the diagnosis or prognosis or determination of the propensity or predisposition to develop Alzheimer's disease is determined by the steps of (i) detecting in a sample obtained from said subject a level, or an activity, or both said level and said activity of a transcription product and/or of a translation product of a gene coding for SGPL1, and (ii) comparing said level or activity, or both said level and said activity of a transcription product and/or of a translation product of a gene coding for SGPL1 to a reference value representing a known health status and/or to a reference value representing a known disease status, and said level, or activity, or both said level and said activity, of said transcription product and/or said translation product is varied compared to a reference value representing a known health status, and/or is similar or equal to a reference value representing a known disease status.

3. A modulator of an activity and/or of a level of at least one substance which is selected from the group consisting of

(i) a gene coding for SGPL1, and/or

(ii) a transcription product of a gene coding for SGPL1, and/or

(iii) a translation product of a gene coding for SGPL1, and/or

(iv) a fragment, or derivative, or variant of (i) to (iii).

4. A recombinant, genetically altered non-human animal comprising a non-native gene sequence coding for SGPL1 or a fragment, or a derivative, or a variant thereof, said animal being obtainable by:

(i) providing a gene targeting construct comprising said gene sequence and a selectable marker sequence, and

(ii) introducing said targeting construct into a stem cell of a non-human animal, and

(iii) introducing said non-human animal stem cell into a non-human embryo, and

(iv) transplanting said embryo into a pseudopregnant non-human animal, and

(v) allowing said embryo to develop to term, and

(vi) identifying a genetically altered non-human animal whose genome comprises a modification of said gene sequence in both alleles, and

(vii) breeding the genetically altered non-human animal of step (vi) to obtain a genetically altered non-human animal whose genome comprises a modification of said endogenous gene, wherein said disruption results in said non-human animal exhibiting a predisposition to developing symptoms of a neurodegenerative disease or related diseases or disorders, preferably symptoms similar to Alzheimer's disease.

5. Use of the recombinant, genetically altered non-human animal according to claim 4 for screening, testing, and validating compounds, agents, and modulators in the development of diagnostics and therapeutics to treat neurodegenerative diseases, in particular Alzheimer's disease.

6. An assay for screening for a modulator of neurodegenerative diseases, in particular Alzheimer's disease, or related diseases or disorders of one or more substances selected from the group consisting of

(i) a gene coding for SGPL1, and/or

(ii) a transcription product of a gene coding for SGPL1, and/or

(iii) a translation product of a gene coding for SGPL1, and/or

(iv) a fragment, or derivative, or variant of (i) to (iii),

said method comprising:

(a) contacting a cell with a test compound;

(b) measuring the activity and/or level of one or more substances recited in (i) to (iv);

(c) measuring the activity and/or level of one or more substances recited in (i) to (iv) in a control cell not contacted with said test compound; and

(d) comparing the levels and/or activities of the substance in the cells of step (b) and (c), wherein an alteration in the activity and/or level of substances in the contacted cells indicates that the test compound is a modulator of said diseases or disorders.

7. A method of screening for a modulator of neurodegenerative diseases, in particular Alzheimer's disease, or related diseases or disorders of one or more substances selected from the group consisting of

(i) a gene coding for SGPL1, and/or

(ii) a transcription product of a gene coding for SGPL1, and/or

(iii) a translation product of a gene coding for SGPL1, and/or

(v) a fragment, or derivative, or variant of (i) to (iii),

said method comprising:

(a) administering a test compound to a non-human test animal which is predisposed to developing or has already developed symptoms of a neurodegenerative disease or related diseases or disorders in respect of the substances recited in (i) to (iv);

(b) measuring the activity and/or level of one or more substances recited in (i) to (iv);

(c) measuring the activity and/or level of one or more substances recited in (i) or (iv) in a matched non-human control animal which is predisposed to developing or has already developed symptoms of a neurodegenerative disease or related diseases or disorders in respect to the substances recited in (i) to (iv) and to which animal no such test compound has been administered;

(d) comparing the activity and/or level of the substance in the animals of step (b) and (c), wherein an alteration in the activity and/or level of substances in

the non-human test animal indicates that the test compound is a modulator of said diseases or disorders.

8. The method according to claim 7 wherein said non-human test animal and/or said control animal is a recombinant, genetically altered animal which expresses the gene coding for SGPL1, or a fragment, or a derivative, or a variant thereof, under the control of a transcriptional control element which is not the native SGPL1 gene transcriptional control element.

9. An assay for testing a compound, preferably for screening a plurality of compounds to determine the degree of binding of said compounds to a SGPL1 translation product, or to a fragment, or derivative, or variant thereof, said assay comprising the steps of:

(i) adding a liquid suspension of said SGPL1 translation product, or a fragment, or derivative, or variant thereof, to a plurality of containers;

(ii) adding a detectable, in particular a fluorescently labelled compound or a plurality of fluorescently labelled compounds to be screened for said binding to said plurality of containers;

(iii) incubating said SGPL1 translation product, or said fragment, or derivative, or variant thereof, and said detectable, in particular fluorescently labelled compound or fluorescently labelled compounds;

(iv) measuring amounts of preferably fluorescence associated with said SGPL1 translation product, or with said fragment, or derivative, or variant thereof; and

(v) determining the degree of binding by one or more of said compounds to said SGPL1 translation product, or said fragment, or derivative, or variant thereof.

10. Use of a protein molecule of SEQ ID NO. 1, said protein molecule being a translation product of the gene coding for SGPL1, or a fragment, or derivative, or variant thereof, as diagnostic target for detecting Alzheimer's disease.

11. Use of a protein molecule of SEQ ID NO. 1, said protein molecule being a translation product of the gene coding for SGPL1, or a fragment, or derivative, or variant thereof, as screening target for reagents or compounds preventing, or treating, or ameliorating Alzheimer's disease.

12. Use of an antibody specifically immunoreactive with an immunogen, wherein said immunogen is a translation product of a gene coding for SGPL1, SEQ ID NO. 1, or a fragment, or derivative, or variant thereof, for detecting a pathological state of a cell in a sample obtained from a subject, comprising immunocytochemical staining of said cell with said antibody, wherein an altered degree of staining or an altered staining pattern in said cell compared to a cell representing a known health status indicates a pathological state of said cell which relates to a neurodegenerative disease, preferably to Alzheimer's disease.